October 3, 2005

Mr. Gregg R. Overbeck
Senior Vice President, Nuclear
Arizona Public Service Company
P. O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - RESPONSE TO NUCLEAR REGULATORY COMMISSION BULLETIN 2003-02, "LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY" (TAC NOS. MC0553, MC0554, AND MC0555)

Dear Mr. Overbeck:

On August 21, 2003, the Nuclear Regulatory Commission (NRC) issued NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," to the industry. This bulletin informed addressees that current methods of inspecting the reactor pressure vessel (RPV) lower heads may need to be supplemented with bare-metal visual inspections in order to detect reactor coolant pressure boundary leakage. The bulletin also requested these addressees to provide the NRC with information related to inspections that have been performed to verify the integrity of the RPV lower head penetrations.

The bulletin requested that addressees provide a description of the RPV lower head penetration inspection program that would be implemented at their respective plants during the next and subsequent refueling outages. This description was to include the extent of the inspection, the inspection methods to be used, the qualification standards for the inspection methods, the process used to resolve the source of findings of boric acid deposits or corrosion, the inspection documentation to be generated, and the basis for concluding that their plant satisfied applicable regulatory requirements related to the structural and leakage integrity of the RPV lower head penetrations.

By letter dated September 19, 2003, Arizona Public Service (APS) provided its response to this request for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2 and 3. In its response, APS committed that it will perform bare-metal visual examinations of the RPV lower head penetrations, during the next refueling outage at each unit and subsequent outages, until a complete as-found bare-metal examination of all RPV lower head penetrations has been performed at these three units. PVNGS, Units 1, 2, and 3 were scheduled to enter refueling outages during spring 2004, fall 2003, and fall 2004, respectively. As noted in its submittal, APS indicated that some penetrations may contain remnants of a spraylat protective coating that was left over from construction. If this occurred, APS would perform a best effort detailed visual examination for leakage. The spraylat material interfering with the examination of the penetrations would be removed from the area of the penetration-RPV lower head interface and the penetrations re-baselined for visual examinations during subsequent refueling outages, until a complete as-found bare-metal examination of all RPV lower head penetrations has been performed at PVNGS, Units 1, 2, and 3.

After performing complete bare-metal examinations at these three units, APS committed to evaluate the results of these examinations as well as those performed by other utilities and inspection results accumulated by the Material Reliability Program, and take into consideration any additional regulatory guidance for determining if additional examinations are required to continue to meet the American Society of Mechanical Engineers Boiler and Pressure Vessel Code requirements. The NRC staff notes that there are a number of ongoing industry and NRC staff activities related to developing criteria for RPV lower head penetration inspections. As such, the NRC staff expects that the criteria for these inspections will involve periodic bare-metal visual examinations or their equivalent.

The bulletin also requested that addressees provide a summary of the RPV lower head penetration inspections that were performed at their plants, the extent of the inspection and the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.

By letter dated July 9, 2004, APS provided a summary of its inspection results at PVNGS, Unit 1. APS reported it had performed a 360-degree as-found visual examination of all 61 RPV lower head penetrations during the spring 2004 refueling outage. Although small flakes of spraylat were found inside some of these penetrations, the spraylat did not obstruct the visual examination. As such, APS determined that cleaning of the RPV lower head penetrations was not required. APS did not observe any evidence of RPV lower head penetration leakage.

By letter dated January 21, 2004, as supplemented by letters dated February 17, 2004, and July 18, 2005, APS provided a summary of its inspection results at PVNGS, Unit 2. APS reported it had performed a 360-degree as-found visual examination of all 61 RPV lower head penetrations during the fall 2003 refueling outage. APS observed residual spraylat, tape, and insulation materials that caused a minor bridging of these RPV lower head penetrations; however, APS stated that this bridging did not restrict the visual inspection. Using a robot equipped with a cleaning nozzle, APS was able to remove these foreign materials from the penetration annulus area and achieve a bare-metal zone on 39 of the 61 RPV lower head penetrations, before equipment problems developed. APS did not observe any evidence of RPV lower head penetration leakage. During the spring 2005 refueling outage, APS again performed an 360-degree as-found visual examination of all 61 RPV lower head penetrations. In addition, APS was able to complete the cleaning process for the 22 penetrations that contained foreign material in the annulus. As such, a bare-metal zone was achieved on all 61 RPV lower head penetrations and a bare-metal visual baseline examination was completed. There was no evidence of RPV lower head penetration leakage observed.

By letter dated January 11, 2005, APS provided a summary of its inspection results at PVNGS, Unit 3. APS reported it had performed a 360-degree as-found visual examination of all 61 RPV lower head penetrations during the fall 2004 refueling outage. APS observed some bridging and blockage of the penetration annulus by residual spraylat, coating, tape, and insulation material; however, APS stated that this bridging did not restrict the visual examination. APS did not observe any evidence of RPV lower head penetration leakage on any of the 61 RPV lower head penetrations. Using a robot equipped with a cleaning nozzle, APS was able to remove the foreign materials from the penetration annulus area and achieve a bare-metal zone on 23 of the 61 penetrations. Due to the differences in the insulation package between the three units, and

unforeseen access problems, APS was not able to clean the remaining 38 penetrations. A bare-metal base line visual examination was performed on the 23 cleaned RPV lower head penetrations. In its letter dated September 19, 2003, as supplemented by letter dated January 11, 2005, APS committed to perform a follow-up bare-metal visual examination of the 23 cleaned penetrations, perform a follow-up as-found visual examination of the 38 remaining penetrations, and clean the remaining 38 penetrations during the spring 2006 refueling outage. As such, APS is requested to make it a regulatory commitment, notify the NRC staff in writing of any change to this commitment in the future, and provide the NRC staff with the results of the RPV lower head inspections planned for the spring 2006 refueling outage.

Based on its review of APS's responses to NRC Bulletin 2003-02, the NRC staff finds that APS has responded appropriately to the reporting requirements of the bulletin for PVNGS, Units 1, 2, and 3. Accordingly, TAC Nos. MC0553, MC0554, and MC0555 are closed for PVNGS, Units 1, 2, and 3, respectively.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-528, 50-529, and 50-530

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Based on its review of APS's responses to NRC Bulletin 2003-02, the NRC staff finds that APS has responded appropriately to the reporting requirements of the bulletin for PVNGS, Units 1, 2, and 3. Accordingly, TAC Nos. MC0553, MC0554, and MC0555 are closed for PVNGS, Units 1, 2, and 3, respectively.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager, Section 2
Project Directorate IV
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